

GLOSSARY OF TERMS

ADIT: A near horizontal passage, driven from the surface, by which a mine may be entered, ventilated, and dewatered.

AFFECTED ENVIRONMENT: The biological and physical environment that will or may be changed by actions proposed and the relationship of people to that environment.

ALLUVIAL: Pertaining to material or processes associated with transportation or deposition by running water.

ALTERNATIVE: A combination of actions or management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of the several policies, plans, or projects proposed for decision making. An alternative need not substitute for another in all respects.

ATTENUATION: The reduction in concentration of a contaminant primarily through chemical interaction with other materials along its flowpath.

BANK CUBIC YARDS: The volume measure of earthen material before it is excavated.

BIOASSAY: An analysis of the concentration of a specific substance in a biological organism.

BIOLOGICAL ASSESSMENT: An evaluation conducted on federal actions in accordance with the Endangered Species Act. The purpose of the assessment is to determine whether the proposed action is likely to affect an endangered, threatened, or candidate species.

CAPILLARY BREAK: An abrupt change in the relative grain size of a soil profile designed to prevent the vertical upward migration of fluid by capillary action, or to slow the downward flow of fluid by causing it to accumulate above the capillary break. Usually composed of coarse material compared to the overlying soil.

CATION EXCHANGE CAPACITY: The sum of exchangeable cations absorbed by a soil, expressed in milliequivalent per 100 grams of oven dry soil.

CHEMICAL MASS BALANCE: The assignment of the measured chemical load, or mass of contaminants to the various source areas, such as surface water or groundwater basins.

COLLUVIUM: Fragments of rock carried and deposited by gravity. Usually coarser than alluvium and only transported a short distance or formed in place with little lateral movement.

CONNECTIVITY: The amount of connection between the pore spaces. Important because it indicates how readily fluid might move through the rock. The greater the connectivity the easier the movement between pore spaces.

CONSENT DECREE: Refers to the agreement between Zortman Mining, Inc., Pegasus Gold Corporation, the State of Montana, the U.S. Environmental Protection Agency, the Fort Belknap Tribal Government, and the Island Mountain Protectors that was signed as part of the settlement of complaints filed under the federal Clean Water Act and the Montana Water Quality Act. The Consent Decree required the mine operator to, among other things, construct seepage capture and treatment systems, develop a water quality improvement plan, conduct the Groundwater Study (WMCI 1998), and implement supplemental environmental projects to offset environmental impacts.

CONSULTATION: Where the term is used to describe discussions between the Fort Belknap government and the Bureau of Land Management, the term is defined by BLM Handbook H8160 as “...the active, affirmative process of: (1) identifying and seeking input from appropriate Native American governing bodies, community groups, and individuals; and (2) considering their interests as a necessary and integral part of the BLM's decision making process. The aim of consultation is to involve affected Native Americans in the identification of issues and the definition of the range of acceptable management options.”

CUBIC-YARDS: A volume measure commonly applied to rock or soil material. One cubic yard is a cube of material that measures one yard in length, width, and height. One cubic-yard equals 27 cubic-feet.

CULTURAL RESOURCES: Remains of human activity, occupation, or endeavor as reflected in sites, buildings, artifacts, ruins, etc.

DIRECTIONAL BORE HOLE: A hole drilled at a specific angle other than vertical. As used in the SEIS, it describes a hole that would be drilled from outside the pit area to intercept groundwater beneath the pit.

ENDANGERED SPECIES: Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range (Endangered Species Act of 1973).

ENVIRONMENTAL IMPACT STATEMENT (EIS): A detailed, written statement as required by Section 102(2)(c) of the National Environmental Policy Act of 1969.

EROSION: The processes whereby earthen or rocky material is worn away by natural forces such as wind, water, or ice and removed from any part of the earth's surface.

FOOTPRINT: The surface expression of the area of disturbance caused by a mine pit, waste rock dump, leach pad, or stockpile. As used, it generally refers to the area where a mine facility was located prior to removal. Reclamation of footprints generally only require placement of soil and revegetation.

FORAGE: Vegetation used for food by wildlife, particularly big game wildlife and livestock.

FORB: Any herbaceous plant other than a grass, especially one growing in a field or meadow.

GAINING STREAM: A stream that gains water as flow proceeds downstream. Water is gained from groundwater inflow and/or tributary streams.

GALLONS PER MINUTE (GPM): A measurement flow per minute. Seepage volumes are sometimes annualized to show what the steady flow in gpm would be if spread out over the entire year.

HEAP LEACH PAD: A lined area upon which ore is placed and leached with cyanide. Leachate accumulates at the base of the ore heap, on top of the leach pad liner, and is processed to remove precious metals from the cyanide solution. The term is also used generically to refer to both the pad liner and the ore stacked upon it.

HYDRAULIC CONDUCTIVITY: A measure of the ease with which water moves through soil or rock; permeability.

HYDROGRAPHS: A graph with measure flow volumes over time. Usually applied to the long term measurement of surface water flow in a river or stream.

HYDROSTRATIGRAPHIC UNITS: A unit rock which functions as an aquifer. Defined more by its groundwater character than by the character of the rock formation.

IN-SITU: Means “in place.” In its original location.

LAND APPLICATION DISPOSAL (LAD): The disposal of excess solution by spray irrigation over a large area where evaporation and plant uptake utilize the water. LAD is also a treatment method for some contaminants such as residual amounts of cyanide, which breaks down when exposed to oxygen and sunlight; or nitrates which are used in plant growth.

LOSING STREAM: A stream that loses water as flow proceeds downstream. Typically, water loss is via infiltration into the ground and evaporation.

MACROINVERTEBRATES: Animals without backbones that are visible without a microscope; insects.

MERRILL-CROWE PLANT: A type of processing plant used to recover gold and silver from cyanide solutions after the leaching process.

MINE WASTE UNIT: A distinct accumulation of rock that is either waste rock or spent ore. Upon reclamation a mine waste unit may be a waste rock dump or leach pad.

MINERALIZATION: The process by which a valuable mineral or minerals are introduced into a rock resulting in a potential or actual ore deposit.

MPDES PERMIT: The Montana Pollution Discharge Elimination System permit. The MPDES permit sets the limits of contaminants that may be discharged to state waters in order to comply with the Montana Water Quality Act.

NAG: Non-Acid Generating material. Material that has been identified through testing as not likely to result in generation of acidic effluent. A layer, or base, composed of NAG material is used in most of the reclamation covers. NAG may be obtained from mined waste or ore with low sulfide content, historic mine tailings, subsoil material, or created, in the case of a base, by mixing agricultural lime with the substrate material.

OSMOTIC STRESS: Stress on plants as evidenced by wilting or browning due to elevated salt content in the soil.

PEAK FLOW: The greatest flow attained during the melting of the winter snowpack or from a storm event. Also known as “Peak Runoff.”

PERMEABILITY: The capacity for transmitting a fluid; depends on the size and shape of the pores, the size and shape of their interconnections, and the extent of the latter. It is measured by the rate at which a fluid of standard viscosity can move a given distance through a given interval of time.

PIEZOMETER: A well, generally of small diameter, that is used to measure the elevation of the water table.

PORE SPACE: The area, or void, between grains or clasts which can contain fluid or liquid. Measured by porosity as a percent of the rock that is void space.

POTENTIOMETRIC SURFACE: The surface or level to which water will rise in a well. The water table is a particular potentiometric surface for an unconfined aquifer.

READY-LINE: As used in the SEIS, the parking area on top of the Montana Gulch Waste Rock Dump where the haul trucks used to park during down times. It is a large flat area with a line of power outlets.

RECLAMATION COVER: The various layers, or combination of layers, of rock material, synthetics (such as GCL, PVC or HDPE), subsoil, soil and vegetation that is placed over the mining area as part of reclamation. May be as simple as a single layer of soil with revegetation, or as complex as multiple

layers of rock soil, and synthetics. Depends upon the availability of construction materials and the nature of the mine waste that is being reclaimed.

RECORD OF DECISION (ROD): A document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision. This is the document that actually selects the alternative to be implemented.

RIPARIAN: Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to the plants of all types that grow along and around springs.

RUBY GULCH TAILINGS - Second grade or waste material derived when raw material is screened or processed that have been placed or washed into Ruby Gulch[?].

SCOPING: A term used to identify the process for determining the scope of issues related to a proposed action and for identifying significant issues to be addressed in an environmental analysis.

SEDIMENTARY: Rock formed of sediment, especially: (1) Clastic rocks, as, conglomerate, sandstone, and shales, formed of fragments of other rock transported from their sources and deposited in water. (2) Rocks formed by precipitation from solution, as rock salt and gypsum, or from secretions of organisms, as most limestone.

SEISMIC: Of, or produced by, earthquakes

SHEAR ZONE: A zone in which shearing has occurred on a large scale so that rock is crushed and brecciated. The shear zones in the mining areas have greatly increased porosity and permeability, allowing rapid water movement.

SULFIDE ZONE: That part of the rock not yet oxidized by air or surface water and containing sulfide minerals. As used at the mines it means the sulfide zones in the pit walls which contain enough sulfides to generate contaminated leachate when in contact with precipitation.

SULFIDE: A mineral composed of sulfur and one other metallic element. The most common sulfide mineral at the mines is iron pyrite (FeS_2).

SYENITE PORPHYRY: The dominant type of igneous rock in the mining areas.

TAILING: Rock that has been mined, crushed and leached. Mine tailings are present in the Ruby Gulch, Alder Gulch and King Creek drainages. These materials range in size from sand sized particles to gravel size.

TECHNICAL WORKING GROUP: The interagency, intergovernmental group of technical specialists from DEQ, BLM, EPA, Fort Belknap, and their consultants, that worked on development of the reclamation alternatives and Multiple Accounts Analysis.

THREATENED SPECIES: Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

THRESHOLD LIMIT VALUE: The acceptable limit for exposure by workers to a potential contaminant.

WASTE ROCK DUMP: Area which waste rock is end-dumped from the top downward, typically without any selective handling criteria being used to sort the more reactive waste rock component.

WASTE ROCK REPOSITORY: An area where waste rock is placed, usually in lifts engineered for isolation of the reactive waste rock component. Typically constructed from the lower portions upward allowing for concurrent surface reclamation and built-in water management structures.

WASTE ROCK: Rock that has to be mined to access precious metal-bearing ore, but does not contain enough mineral to be mined and processed at a profit.

WATER BARRIER RECLAMATION COVER: A cover system designed, constructed, and maintained to prevent moisture infiltration to the waste below.

WATER BALANCE RECLAMATION COVER: A cover system designed to maintain a moisture balance that results in the rapid physical, chemical, and biological stabilization of the waste. A water balance cover contains enough soil in the upper part of the profile to “hold” the precipitation within the soil pore spaces until it can evaporate or be utilized by vegetation.

WATERSHED: The area from which runoff water drains to a specific stream or drainage. Surface water watersheds correspond to the topography unless the drainage is diverted. Groundwater watersheds may not correspond to the topography but follow geologic structures or underground mine workings.